State of Utah

Department of Environmental Quality

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DAQ-031-08

M E M O R A N D U M

TO: Air Quality Board

THROUGH: Cheryl Heying, Executive Secretary

FROM: Robert Clark, Environmental Scientist

DATE: May 7, 2008

SUBJECT: PROPOSE FOR PUBLIC COMMENT: Amend R307-328 Ozone Nonattainment and Maintenance Areas and Utah and Weber Counties: Gasoline Transfer and Storage; and R307-342 Ozone Nonattainment and Maintenance Areas: Qualification of Contractors and Test Procedures for Vapor Recovery Systems for Gasoline Delivery Tanks.

Stage I vapor recovery systems collect vapors resulting from the dispensing of gasoline to underground storage tanks. Stage I vapor recovery requirements were implemented in Salt Lake and Davis Counties in the 1980's and in Utah and Weber Counties in 1999. They have proven to be a successful method of controlling both volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions along the Wasatch Front. Based on 2005 data, it is estimated that approximately 3,595 tons of VOC and 282 tons of HAP have been prevented from entering the atmosphere along the Wasatch Front annually by implementation of Stage I vapor recovery systems.

A growing information base indicates that the emission of ozone precursors and the subsequent formation of ozone is no longer an issue only along the Wasatch Front, but is a concern across a broad expanse of the intermountain west, including most of rural Utah. With the recent tightening of the National Ambient Air Quality Standard (NAAQS) for ozone, it has become necessary to consider expanding Stage I Vapor Recovery requirements throughout the State of Utah.

A stake holder meeting was held on January 16, 2008, to discuss the feasibility of extending Stage I vapor recovery requirements to the remaining twenty-five counties within the State of Utah. In preparation for this stakeholder meeting a cost-benefit analysis was prepared by DAQ staff that showed that over two thousand tons of VOC and HAP emissions could be eliminated annually if Stage I controls were implemented statewide. That cost-benefit analysis is attached to this memorandum. The consensus of stakeholders present at the meeting was that DAQ should be proactive and take necessary steps to establish Stage I controls statewide at this time.

Much of the discussion at the stakeholder meeting centered on how to best schedule the implementation of Stage I controls. The Utah Petroleum Marketing Association felt it would not be appropriate to expect all gas dispensing facilities to have this work completed in 6 months or even 1 year. For example, the availability of equipment (hardware to make the conversion) could be a problem if facilities had to be in compliance within a short time frame; therefore a phase-in of facilities was recommended. Most present felt that implementation of Stage I should be phased in either by county, or facility thru-put, or worst areas first. Representatives from larger commercially run companies with large numbers of stations felt they would need a minimum of two to three years to implement stage I modifications. Scheduling the work and availability of equipment would be the hardest questions to address. Smaller private facilities could be impeded by up-front capital costs.

It was also noted by a representative of one of the companies certified to make storage tank modifications that the implementation costs cited in DAQ's report may be higher than what actual costs might be. He stated that, "$750 per tank and $2,400 per station, where digging and cement work were not needed, would be more in line with actual costs." These dollar costs are about one-third of those cited in DAQ's original report and would make conversion to stage I vapor recovery even more cost effective that noted in the report.

In response to the recommendation of stakeholders, DAQ has taken the necessary steps to modify the air quality rules that pertain to Stage I vapor recovery. Air Quality rule R307-328 requires gasoline transport vehicles and the bulk plants and service stations which receive gasoline from them to capture vapors released during transfer operations. R307-342 requires that gasoline delivery equipment provide leak-tight loading and off-loading, and specifies procedures by which contractors may become certified to perform leak tightness tests. In the case of R307-342 only the title was changed to make the rule apply statewide.

Recommendation: DAQ staff recommends adopting Stage I Vapor Recovery technology throughout the state of Utah to aid in reducing the formation of ozone, PM2.5, and exposure to benzene. Accordingly, it is recommended that the proposed changes to R307-328 (Gasoline Transfer and Storage) and R307-342 (Qualification of Contractors and Test Procedures for Vapor Recovery Systems for Gasoline Delivery Tanks), pertaining to the extension of Stage I Vapor Recovery requirements to all counties within the State of Utah, be proposed for public comment.

An Analysis of the Relative Benefits and Costs Related to the Extension of Stage I Vapor Recovery Systems to all Counties of the State of Utah

Prepared by

Utah Division of Air Quality

December 2007

Gasoline Vapor Recovery Systems

Background

Gasoline vapors consist of Volatile Organic Compounds (VOC), and can be released during any operation involving gasoline transfer between storage tanks, delivery trucks, gas stations, private vehicles, etc. VOCs are critical components in the formation of two pollutants that are of concern in Utah – ozone (O_3) and particulate matter with a diameter of 2.5 micrometers or less ($PM_{2.5}$). The Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) to protect the general public against designated criteria pollutants. Ozone and $PM_{2.5}$ have been designated as criteria pollutants and are controlled under these standards. Criteria pollutants are widely distributed all over the country and are regulated by the EPA due to their detrimental affects on human health and the environment. In certain areas of Utah, depending on the season of the year and other contributing factors, both ozone and $PM_{2.5}$ concentration levels approach, and sometimes exceed, those allowed by EPA regulations. Of particular concern is the growing information base that indicates that ozone is no longer an issue only along the Wasatch Front, but is a concern across a broad expanse of the intermountain west, including Utah.

Vapor loss of VOCs may occur at several stages of the gasoline refining, storage, and transport process. Vapor loss at refineries, bulk storage plants, and transport vehicles is largely prevented by existing controls, many of which were installed as required in the Utah State Implementation Plan for Ozone. Vapor loss that occurs during the delivery of gasoline from delivery tank trucks to gasoline stations along the Wasatch Front is controlled by Utah Stage I vapor recovery rules described below.

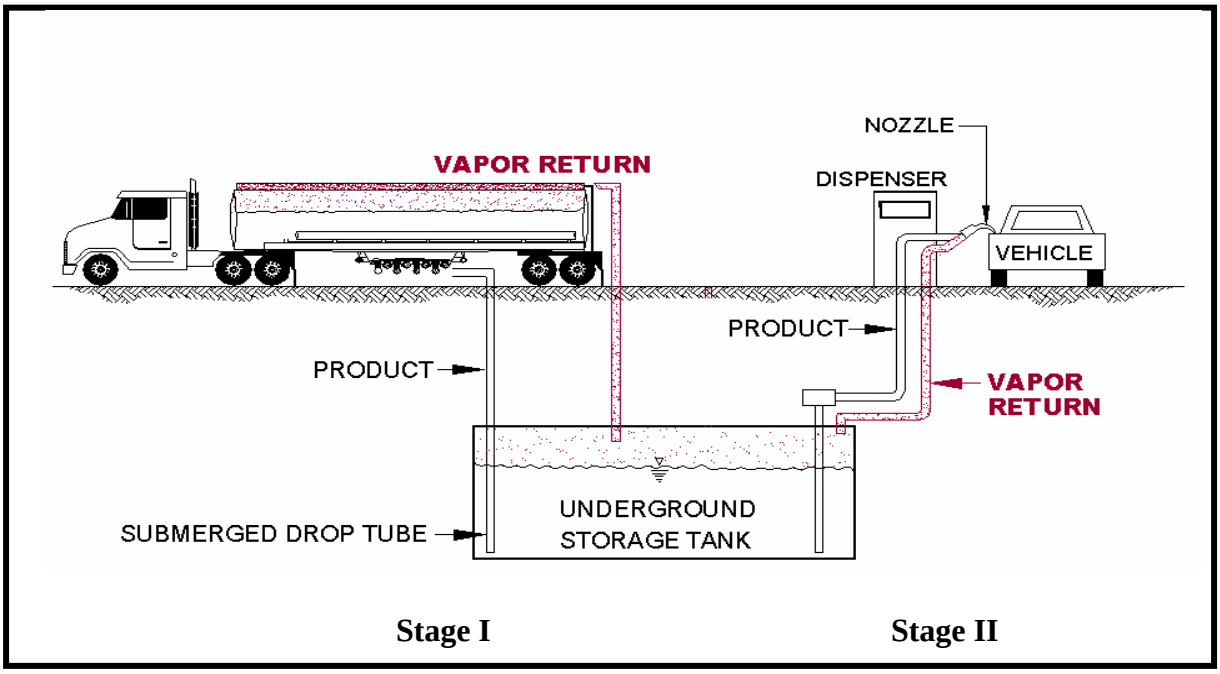
Stage I and Stage II Vapor Recovery Systems

Gasoline vapor recovery systems are categorized in two stages, as shown in Figure I below. Stage I gasoline vapor recovery systems are designed to capture the vapors expelled from an underground storage tank (UST) at a gas station when it is being filled. In this process, as gasoline is dispensed into the UST, excess vapors from the UST are transferred back into the tank truck and returned to the tank farm or loading facility where they are reprocessed or burned. Current state rules require delivery trucks that service Wasatch Front gas stations to be vapor-tight and equipped to recover vapors and return them to the loading facilities. Stage I vapor recovery was implemented in Salt Lake and Davis Counties in the 1980's and in Weber and Utah Counties in 1999.

Stage II systems capture gasoline vapors that would otherwise be vented during individual vehicle refilling at gas stations (See Figure I). In Utah, Stage II vapor recovery was adopted as a contingency measure in 1993 but was never implemented due to excessive costs ($30,000 to $50,000/station). The Clean Air Act Amendments of 1990 required auto makers nationwide to equip new vehicles with Onboard Refueling Vapor Recovery systems (ORVR) as an alternative to Stage II. This vapor recovery method sends gasoline vapors displaced during refueling through an on-board vapor recovery canister and then back into the vehicle fuel system. The Environmental Protection Agency (EPA) originally adopted regulations implementing this

requirement in 1994, and as of 2000, all new gasoline powered light duty vehicles sold in the United States are equipped with ORVR systems. As ORVR-equipped vehicles continue to permeate the market, Stage II vapor recovery systems become unnecessary. EPA estimates that in 2006 approximately 60% of the US vehicle fleet was equipped with ORVR and that this percentage will increase to more than 90% by 2012, thereby eliminating the need for Stage II vapor recovery systems.

Figure 1. Schematic diagram of Stage I and Stage II Vapor Recovery Systems



Benefits of Stage I Vapor Recovery

Table 1 below shows the amount of vapor loss that could be eliminated if Stage I vapor control systems were put in place on all gasoline tank trucks and gasoline stations throughout Utah. It shows the amount of gasoline dispensed in each county (2005) and the corresponding vapor loss reduction that could be expected if Stage I vapor control systems were in place. As mentioned earlier, Stage I Vapor Recovery was previously implemented in Davis, Salt Lake, Utah, and Weber Counties and has already accounted for reduced vapor loss from VOCs in those counties. This is indicated by the zero values in the difference column for these four counties. The vapor loss figures for the remaining twenty-five counties indicate the amount of reduction that could be realized from the implementation of Stage I Vapor Recovery systems. The remaining amount of vapor loss that could be realized for the whole state is 2,157 tons of VOC per year.

Table 1. Gasoline dispensed by county and corresponding VOC vapor losses with and without Stage I vapor controls (based on 2005 emissions inventory).

County	Total Gasoline Dispensed (2005) (kgal/year)	VOC Emissions without Stage I VR (tons/year)	VOC Emissions with Stage I VR (tons/year)	Difference in VOC Vapor Loss (tons/year)
Beaver	10,446	66.57	9.19	57.38
Box Elder	36,680	233.75	32.28	201.47
Cache	37,767	240.67	33.24	207.43
Carbon	11,976	78.32	10.54	67.78
Daggett	1,414	9.01	1.25	7.76
Davis	**96,375**	**84.17**	**84.17**	**0**
Duchesne	8,588	54.73	7.56	47.17
Emery	15,218	96.98	13.39	83.59
Garfield	4,934	31.44	4.34	27.10
Grand	11,003	70.12	9.68	60.44
Iron	26,383	168.13	23.22	144.91
Juab	16,437	104.75	14.47	90.28
Kane	5,480	34.92	4.82	30.10
Millard	18,546	118.19	16.32	101.87
Morgan	5,449	34.72	4.80	29.92
Piute	1,065	6.78	0.94	5.84
Rich	2,189	13.95	1.93	12.02
Salt Lake	**344,172**	**300.57**	**300.57**	**0**
San Juan	11,502	73.30	10.12	63.18
Sanpete	10,263	65.40	9.03	56.37
Sevier	17,437	111.12	15.35	95.77
Summit	29,113	185.53	25.62	159.91
Tooele	36,514	232.69	32.14	200.55
Uintah	13,704	87.33	12.06	75.27
Utah	**150,354**	**131.30**	**131.30**	**0**
Wasatch	11,506	73.32	10.13	63.19
Washington	47,153	300.49	41.50	258.99
Wayne	1,600	10.20	1.41	8.79
Weber	**65,000**	**56.76**	**56.76**	**0**
Totals	1,048,268	3,075.21	918.13	2,157.08

Bold indicates counties where Stage I vapor recovery has already been implemented.

Hazardous Air Pollutants (HAPs) are also found in VOCs. Table 2 shows the percentage of specific HAPs contained in gasoline vapors and the amount of reduction of these hazardous pollutants that might be expected if Stage I vapor control systems were in place throughout the state. This data is based on gasoline distribution in non-Wasatch Front counties identified in Table 1 (i.e., 392,367,000 gallons in 2005). Results show that a reduction of approximately 162.5 tons of HAPs per year could be expected if Stage I vapor control measures were in place throughout the state.

Table 2. Hazardous Air Pollutant reduction associated with and without Stage I Vapor Recovery (2005).

Pollutant	HAP % of Gasoline Vapor	HAPs Emissions Without Stage I VR (tons/year)	HAPs Emissions With Stage I VR (tons/year)	HAPs Reduction Achieved by Stage I VR (tons/year)
2,2,4 Trimethylpentane	0.83%	25.415	7.592	17.823
Benzene	0.71%	21.820	6.519	15.301
Cumene	0.01%	0.307	0.092	0.215
Ethyl Benzene	0.14%	4.241	1.267	2.974
Hexane	1.59%	48.833	14.589	34.244
Methyl-Tert-Butyl-Ether	2.40%	73.756	22.035	51.721
Naphthalene	0.05%	1.414	0.422	0.992
Toluene	1.29%	39.644	11.844	27.800
Xylene	0.53%	16.288	4.866	11.422
Totals	**7.55%**	**231.718**	**69.226**	**162.492**

Costs to upgrade Gasoline Stations and Delivery Tank Trucks to Stage I Standards

Equipment and labor cost estimates used in this section were obtained from several UST and tank trailer contractors that have been involved in recent upgrades of USTs and tank trailer vehicles along the Wasatch Front. The figures used are updated to reflect current (2007) costs.

Gasoline Stations and Underground Storage Tanks

The following table presents a current (as of 2005) listing of the number gasoline stations, USTs, and USTs per service station in each of Utah's counties.

Table 3. Gasoline Station and Underground Storage Tank (UST) data (2005).

County	Active Stations	Active USTs	USTs per Station
Beaver	15	58	3.87
Box Elder	35	100	2.86
Cache	60	146	2.43
Carbon	22	63	2.86
Daggett	6	14	2.33
Davis	104	310	2.98
Duchesne	11	32	2.91
Emery	12	41	3.42
Garfield	17	53	3.12
Grand	15	43	2.87
Iron	44	144	3.27
Juab	11	37	3.36
Kane	23	72	3.13
Millard	29	81	2.79
Morgan	7	20	2.86
Piute	2	5	2.50
Rich	4	7	1.75
Salt Lake	535	1,442	2.70
San Juan	27	69	2.56
Sanpete	23	65	2.83
Sevier	19	63	3.32
Summit	29	81	2.79
Tooele	38	118	3.11

County	Active Stations	Active USTs	USTs per Station
Uintah	20	54	2.70
Utah	165	498	3.02
Wasatch	22	57	2.59
Washington	75	232	3.09
Wayne	6	16	2.67
Weber	113	340	3.01
Totals	1489	4261	2.86

There are two basic situations when considering Stage I upgrade costs:

- The first situation is where the UST can easily be retrofitted with Stage I inlet and vapor recovery pipes. The existing drop tube (inlet pipe) could be removed and replaced with minimal effort. In this process, a submerged drop tube would replace an ordinary drop tube and a vapor recovery pipe would be installed at a different access point on the tank. The cost of this upgrade is approximately $665 for parts and two hours labor at $70 per hour for a total cost of about $800 per compartment. Most USTs have three compartments which bring the cost to about $2,400 per tank. The total cost per station based on an average of three USTs per station, would be approximately $7,200.

- The second situation is where the UST is equipped with drop tubes (inlet tubes) that are permanently welded to the tank. In this case, the drop tubes would have to be manually removed and reconfigured with a coaxial tube configuration or a new standard fill pipe and new vapor recovery pipe, plus associated valves and fittings. The costs associated with this type of upgrade is about $665 for parts plus an increased labor cost of about $2,000, for a total of $2,665 per compartment, or about $8000 per tank. Thus the cost for a typical station with three USTs would be about $24,000.

It is unknown at this time what the percentage of stations in each situation is throughout the state. This information will be collected during a stakeholder process.

Delivery Vehicles – Tank Trailers

Gasoline tank trailers that service gas stations typically have three or four compartments per trailer. Equipment costs involved to upgrade a non-Stage I delivery tank trailer include:

Adapters – one per tank trailer to mate with a Stage I UST	$100
Second hose for the returning vapors, one per tank trailer	$220

The estimated total cost to upgrade a non-Stage I equipped tank trailer to Stage I standards is $320. This is a one-time cost that must be assumed by the tank trailer owner. Most of the tank trailers in the state are already configured to service gasoline stations along the Wasatch Front, and, therefore, will not require modifications to implement Stage I statewide. Therefore vehicle reconfiguration costs will not be included in the overall cost estimate to implement Stage I Vapor Recovery.

Total Costs

The costs associated with the implementation of Stage I Vapor Recovery in all Utah counties are shown in table 4. The costs vary greatly, particularly among Utah's more rural counties. In general, counties that have more gasoline stations and, therefore, dispense a greater volume of gasoline will have lower implementation costs per ton of VOC reduction achieved than counties with fewer gasoline stations that dispense less gasoline. Costs to implement Stage I Vapor Recovery range from a low of $984 per ton of VOC emission reduction in Juab County to a high of $19,136 per ton of VOC emission reduction in Kane County. The average minimum and maximum costs are calculated at the end of Table 4.

Table 4. Cost to implement Stage I Vapor Recovery based on number of active USTs (by county).

County	Active USTs	Minimum Cost @ $2,400/UST	Maximum Cost @ $8,000/UST	Minimum Cost per ton of VOC Reduction	Maximum Cost per ton of VOC Reduction
Beaver	58	$139,200	$464,000	$2,426	$8,086
Box Elder	100	$240,000	$800,000	$1,191	$3,971
Cache	146	$350,400	$1,168,000	$1,689	$5,631
Carbon	63	$151,200	$504,000	$2,231	$7,436
Daggett	14	$33,600	$112,000	$4,330	$14,433
Davis	**310**	**complete**	**complete**	**complete**	**complete**
Duchesne	32	$76,800	$256,000	$1,628	$5,427
Emery	41	$98,400	$328,000	$1,177	$3,924
Garfield	53	$127,200	$424,000	$4,694	$15,646
Grand	43	$103,200	$344,000	$1,707	$5,692
Iron	144	$345,600	$1,152,000	$2,385	$7,950
Juab	37	$88,800	$296,000	$984	$3,279
Kane	72	$172,800	$576,000	$5,741	$19,136
Millard	81	$194,400	$648,000	$1,908	$6,361
Morgan	20	$48,000	$160,000	$1,604	$5,348
Piute	5	$12,000	$40,000	$2,055	$6,849
Rich	7	$16,800	$56,000	$1,398	$4,659
Salt Lake	**1442**	**complete**	**complete**	**complete**	**complete**
San Juan	69	$165,600	$552,000	$2,621	$8,737
Sanpete	65	$156,000	$520,000	$2,767	$9,225
Sevier	63	$151,200	$504,000	$1,579	$5,263
Summit	81	$194,400	$648,000	$1,216	$4,052
Tooele	118	$283,200	$944,000	$1,412	$4,707
Uintah	54	$129,600	$432,000	$1,722	$5,739
Utah	**498**	**complete**	**complete**	**complete**	**complete**
Wasatch	57	$136,800	$456,000	$2,165	$7,216
Washington	232	$556,800	$1,856,000	$2,150	$7,166
Wayne	16	$38,400	$128,000	$4,369	$14,562
Weber	**340**	**complete**	**complete**	**complete**	**complete**
Totals	4261	$4,010,400	$13,368,000		

Average minimum cost / ton of VOC reduction = $4,010,400 / 2,157.08 tons* = $1,859 / ton.
Average maximum cost / ton of VOC reduction = $13,365,000 / 2,157.08 tons* = $6,197 / ton.
(* from Table 1)

Discussion

In general, counties with large populations and high volumes of dispensed gasoline would experience a lower cost per ton reduction for VOC and HAP emissions, than counties with smaller populations and lower volumes of dispensed gasoline. The average cost to implement Stage I vapor recovery in the twenty-five non-Wasatch Front counties varies between $1,859 and $6,197 per ton of annual emission reduction. The actual cost in many counties would be less than these amounts (see table 4).

There are only four counties (Daggett, Garfield, Kane, and Wayne) where the forecast maximum cost could be greater than $10,000. This is due to the combined relatively low amount of gasoline dispensed and the relatively higher number of gas stations. The current rules implementing Stage I along the Wasatch Front allow exemptions for stations with small USTs or low through-puts, and during the stakeholder process, we would specifically seek information regarding how this exemption would help to avoid unacceptable implementation costs in the rural areas. However, at this time, based on current information, we do not believe that it will be advisable to ignore these more rural counties, since they may each have stations that dispense a disproportionate amount of gasoline in the county, and perhaps during different seasons of the year. An example of this might be the marina gas station in Manila, Daggett County, where boats routinely refill their tanks during the summer months.

Finally, in 2005, only 3.4 percent of the gasoline sold in Utah (13.4 million gallons) was sold in those four counties. Even though initial implementation costs could be higher in these counties, the costs could be amortized over a relatively short period of time, normally 3-5 years, while the emission reductions realized would be available forever. These are points that would be discussed during the stakeholder process.

Conclusion

Stage I Vapor Recovery systems have been found to be a successful method of controlling VOC and HAP emissions along the Wasatch Front. It has been demonstrated herein that Stage I Vapor Recovery could also be a viable method of controlling these harmful emissions throughout the remainder of the State of Utah. The benefit and cost parameters discussed in this report show that implementation of Stage I Vapor Recovery Systems throughout the remainder of the State of Utah would be both cost effective and environmentally beneficial. Making this change now will protect our health, our quality of life and the environment for years to come.

R307. Environmental Quality, Air Quality.

R307-328. [~~Ozone Nonattainment and Maintenance Areas and Utah and Weber Counties:~~] Gasoline Transfer and Storage.

R307-328-1. Purpose.

The purpose of R307-328 is to establish Reasonably Available Control Technology (RACT) for control of gasoline vapors during the filling of gasoline transport vehicles and storage tanks in Utah. [~~ozone nonattainment and maintenance areas and Utah and Weber Counties.~~] The rule is based on federal control technique guidance documents. This requirement is commonly referred to as stage I vapor recovery.

R307-328-2. Applicability.

(1) Transport Vehicles. R307-328 applies to the owner or operator of any gasoline tank truck, railroad tank car, or other gasoline transport vehicle that loads or unloads gasoline in Utah [~~or Weber County or any ozone nonattainment or maintenance area~~].

(2) Gasoline Dispensing. R307-328 applies to the owner or operator of any bulk terminal, bulk plant, stationary storage container, or service station located in Utah [~~or Weber County or any ozone nonattainment or maintenance area~~].

(3) This rule applies to all transport vehicles and dispensing facilities that operate within Utah according to the compliance schedule defined in section 328-9 of this rule.

R307-328-3. Definitions.

The following additional definitions apply to R307-328.

"Bottom Filling" means the filling of a tank through an inlet at or near the bottom of the tank designed to have the opening covered by the liquid after the pipe normally used to withdraw liquid can no longer withdraw any liquid.

"Qualified contractor" means a contractor who has been qualified by the executive secretary in accordance with R307-342 to perform vapor tightness tests on gasoline transport vehicles.

"Submerged Fill Pipe" means any fill pipe with a discharge opening which is entirely submerged when the liquid level is 6 inches above the bottom of the tank and the pipe normally used to withdraw liquid from the tank can no longer withdraw any liquid.

R307-328-4. Loading of Tank Trucks, Trailers, Railroad Tank Cars, and Other Transport Vehicles.

(1) No person shall load or permit the loading of gasoline into any tank truck, trailer, railroad tank car, or other transport vehicle unless the emissions from such vehicle are controlled by use of a vapor collection and control system and submerged or bottom filling. RACT shall be required and in no case shall vapor emissions to the atmosphere exceed 0.640 pounds per 1,000 gallons transferred.

(2) Such vapor collection and control system shall be properly installed and maintained.

(3) The loading device shall not leak.

(4) The loading device shall utilize the dry-break loading design couplings and shall be maintained and operated to allow no

more than an average of 15 cc drainage per disconnect for 5 consecutive disconnects.

(5) All loading and vapor lines shall be equipped with fittings which make a vapor tight connection and shall automatically close upon disconnection to prevent release of the organic material.

(6) A gasoline storage and transfer installation that receives inbound loads and dispatches outbound loads ("bulk plant") need not comply with R307-328-4 if it does not have a daily average throughput of more than 3,900 gallons (15,000 or more liters) of gasoline based upon a 30-day rolling average. Such installations shall on-load and off-load gasoline by use of bottom or submerged filling or alternate equivalent methods. The emission limitation is based on operating procedures and equipment specifications using Reasonably Available Control Technology as defined in EPA documents EPA 450/2-77-026 October 1977, "Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals," and EPA-450/2-77-035 December 1977, "Control of Volatile Organic Emissions from Bulk Gasoline Plants." The design effectiveness of such equipment and the operating procedures must be documented and submitted to and approved by the executive secretary.

(7) Hatches of transport vehicles shall not be opened at any time during loading operations except to avoid emergency situations or during emergency situations. Pressure relief valves on storage tanks and transport vehicles shall be set to release at the highest possible pressure, in accordance with State or local fire codes and National Fire Prevention Association guidelines. Pressure in the vapor collection system shall not exceed the transport vehicle pressure relief setting.

(8) Each owner or operator of a gasoline storage [~~and~~] or dispensing installation shall conduct testing of vapor collection systems used at such installation and shall maintain records of all tests for no less than two years. Testing procedures of vapor collection systems shall be approved by the executive secretary and shall be consistent with the procedures described in the EPA document, "Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems," EPA-450/2-78-051.

(9) Semi-annual testing shall be conducted and records maintained of such test. The frequency of tests may be altered by the executive secretary upon submittal of documentation which would justify a change.

(10) The vapor collection and vapor processing equipment shall be designed and operated to prevent gauge pressure in the delivery vessel from exceeding 18 inches of water and prevent vacuum from exceeding 6 inches of water. During testing and monitoring, there shall be no reading greater than or equal to 100 percent of the lower explosive limit measured at 1.04 inches around the perimeter of a potential leak source as detected by a combustible gas detector. Potential leak sources include, but are not limited to, piping, seals, hoses, connections, pressure or vacuum vents, and vapor hoods. In addition, no visible liquid leaks are permitted during testing or monitoring.

R307-328-5. Stationary Source Container Loading.

1) No person shall transfer or permit the transfer of gasoline from any delivery vessel (i.e. tank truck or trailer) into any stationary storage container with a capacity of 250 gallons or greater unless such container is equipped with a submerged fill pipe and at least 90 percent of the gasoline vapor, by weight, displaced during the filling of the stationary storage container is prevented from being released to the atmosphere. This requirement shall not apply to:

(a) the transfer of gasoline into any stationary storage container of less than 550 gallons used primarily for the fueling of implements of husbandry if such container is equipped with a permanent submerged fill pipe;

(b) the transfer of gasoline into any stationary storage container having a capacity of less than 2,000 gallons which was installed prior to January 1, 1979, if such container is equipped with a permanent submerged fill pipe;

(c) the transfer of gasoline to storage tanks equipped with floating roofs or their equivalent which have been approved by the executive secretary.

(2) The 90 percent performance standard of the vapor control system shall be based on operating procedures and equipment specifications. The design effectiveness of such equipment and the operating procedure must be documented and submitted to and approved by the executive secretary.

(3) Each owner or operator of a gasoline storage tank or the owner or operator of the gasoline delivery vessel subject to (1) above shall install vapor control equipment, which includes, but is not limited to:

(a) vapor return lines and connections sufficiently free of restrictions to allow transfer of vapor to the delivery vessel or to the vapor control system, and to achieve the required recovery;

(b) a means of assuring that the vapor return lines are connected to the delivery vessel, or vapor control system, and storage tank during tank filling;

(c) restrictions in the storage tank vent line designed and operated to prevent:

(i) the release of gasoline vapors to the atmosphere during normal operation; and

(ii) gauge pressure in the delivery vessel from exceeding 18 inches of water and vacuum from exceeding 6 inches of water.

R307-328-6. Transport Vehicles.

(1) Gasoline transport vehicles must be designed and maintained to be vapor tight during loading and unloading operations as well as during transport, except for normal pressure venting required under United States Department of Transportation Regulations.

(2) The design of the vapor recovery system shall be such that when the delivery tank is connected to an approved storage tank vapor recovery system or loading terminal, 90% vapor recovery efficiencies are realized. The connectors of the delivery tanks

shall be compatible with the fittings on the fill pipes and vapor vents at the storage containers and gasoline loading terminals where the delivery tank will service or be serviced. Adapters may be used to achieve compatibility.

(3) No person shall knowingly allow the introduction of gasoline into, dispensing of gasoline from, or transportation of gasoline in a gasoline transport vehicle without a current Utah Vapor Tightness Certificate.

(4) A vapor-laden transport vehicle may be refilled only at installations equipped to recover, process or dispose of vapors. Transport vehicles that only service locations with storage containers specifically exempted from the requirements of R307-328-5 need not be retrofitted to comply with R307-328-6(1)-(3) above, provided such transport vehicles are loaded through a submerged fill pipe or equivalent equipment provided the design and effectiveness of such equipment are documented and submitted to and approved by the executive secretary.

R307-328-7. Leak Tight Testing.

(1) Gasoline tank trucks and their vapor collection systems shall be tested for leakage by a qualified contractor using procedures approved by the executive secretary and consistent with the procedures described in R307-342.

(2) Gasoline tank trucks and their vapor collection systems shall be tested for leakage annually between December 1 and May 1.

(3) The tank shall not sustain a pressure change of more than 750 pascals (3 inches of H_2O) in five minutes when pressurized (by air or inert gas) to 4500 pascals (18 inches of H_2O) or evacuated to 1500 pascals (6 inches of H_2O).

(4) No visible liquid leaks are permitted during testing.

(5) Gasoline tank trucks shall be certified leak tight at least annually by a qualified contractor approved by the executive secretary.

(6) Each owner or operator of a gasoline tank truck shall have in his possession a valid vapor tightness certification, which:

(a) shows the date that the gasoline tank truck last passed the Utah vapor tightness certification test; and

(b) shows the identification number of the gasoline tank truck.

(7) Records of certification inspections, as well as any maintenance performed, shall be retained by the owner or operator of the tank truck for a two year period and be available for review by the executive secretary or the executive secretary's representative.

R307-328-8. Alternate Methods of Control.

(1) Any person may apply to the executive secretary for approval of an alternate test method, an alternate method of control, an alternate compliance period, an alternate emission limit, or an alternate monitoring schedule. The application must include a demonstration that the proposed alternate produces an equal or greater air quality benefit than that required by R307-

328, or that the alternate test method is equivalent to that required by these rules. The executive secretary shall obtain concurrence from EPA when approving an alternate test method, an alternate method of control, an alternate compliance period, an alternate emission limit, or an alternate monitoring schedule.

(2) Manufacturer's operational specifications, records, and testings of any control system shall use the applicable EPA Reference Methods of 40 CFR Part 60, the most recent EPA test methods, or EPA-approved state methods, to determine the efficiency of the control device. In addition, the owner or operator must meet the applicable requirements of record keeping for any control device. A record of all tests, monitoring, and inspections required by R307-328 shall be maintained by the owner or operator for a minimum of 2 years and shall be made available to the executive secretary or the executive secretary's representative upon request. Any malfunctioning control device shall be repaired within 15 calendar days after it is found by the owner or operator to be malfunctioning, unless otherwise approved by the executive secretary.

(3) For purposes of determining compliance with emission limits, volatile organic compounds and nitrogen oxides will be measured by the test methods identified in federal regulation or approved by the executive secretary. Where such a method also inadvertently measures compounds with negligible photochemical reactivity, an owner or operator may exclude these negligibly reactive compounds when determining compliance with an emissions standard.

R307-328-9. Compliance Schedule.

~~[(1) Sources located within any newly designated nonattainment area for ozone shall be in compliance with this rule within 180 days of the effective date of designation to nonattainment.]~~

(1) Effective May 1, 2000, all Facilities located in Davis, Salt Lake, Utah, and Weber Counties shall be in compliance with this rule.

(2) All other facilities located in Utah, shall be in compliance with this rule according to the following phase-in schedule:

(a) Facilities located in Box Elder, Cache, Tooele and Washington Counties shall be in compliance with this rule by April 30, 2009.

(b) Facilities located in Emery, Iron, Juab, Millard, Sevier, Summit and Uintah Counties shall be in compliance with this rule by April 30, 2010.

(c) All facilities located in Utah shall be in compliance with this rule by April 30, 2011.

(2) If this implementation schedule results in a scheduling and/or financial hardship for an individual facility, that facility may request a six-month extension from the Executive Secretary of the Utah Air Quality Board. A maximum of two six-month extensions may be granted. Regardless of extension requests submitted, all facilities must be in compliance with this rule not

later than April 30, 2011.

(3) A request for an extension must be documented and contain valid reasons why a facility will not able to meet the phase-in schedule indicated in (1)(a) or (b) above. A late start on preparation or planning is not a valid reason to grant an extension. The request for extension must also contain a proposed implementation schedule that shows compliance to this rule at the earliest possible date, but no later than April 30, 2011.

R307-328-10 Authorized Contractors

(1) All modifications performed on underground storage tanks regulated by Title 19, Chapter 6, Part 4, the Utah Underground Storage Tank Act, to bring them into compliance with R307-328, shall be performed by contractors certified under R311-201.

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R307. Environmental Quality, Air Quality.

R307-342. [~~Ozone Nonattainment and Maintenance Areas:~~] Qualification of Contractors and Test Procedures for Vapor Recovery Systems for Gasoline Delivery Tanks.

R307-342-1. Purpose.

The purpose of R307-342 is to establish the requirements for the qualification of contractors to perform vapor tightness tests on gasoline transport vehicles equipped with vapor recovery equipment.

R307-342-2. Applicability.

R307-342 is applicable to anyone who wishes to become qualified by the executive secretary to perform vapor tightness tests on gasoline transport vehicles that are required to be equipped with gasoline vapor recovery equipment and to be tested in accordance with R307-328-7.

R307-342-3. Contractor Qualification Requirements.

(1) Any person may become qualified to perform delivery tank vapor tightness tests by:

(a) preparing a written, detailed and approvable procedure by which the person proposes to conduct the pressure/vacuum test. The minimum test performance requirements are described in R307-342-5 and R307-342-6;

(b) submitting the procedure with a letter requesting approval of the procedure and qualification of the person as a qualified testing contractor;

(c) having the necessary facilities, equipment and expertise to perform a satisfactory test; and

(d) performing an acceptable demonstration test with a representative of the executive secretary in attendance.

(2) The person determined qualified to perform the tests will be issued a letter of qualification by the executive secretary valid for one year.

(3) Re-qualification will be accomplished by:

(a) requesting by letter to be requalified by the executive secretary; and

(b) performing an acceptable demonstration test with a representative of the executive secretary in attendance after which a letter of requalification will be sent.

R307-342-4. Equipment Requirements.

(1) Pressure Source. An air pump, shop compressed air, compressed gas tanks of air or inert gas, or other approved air pressure producing source or procedure sufficient to pressurize the tank to 18 inches of water above atmospheric pressure is required. Some models of reversible tank-type shop vacuum cleaners will perform adequately.

(2) Vacuum Source. A vacuum pump or other approved vacuum producing procedure capable of evacuating the tank to 6 inches of water is required. For example, some models of shop vacuum cleaners can accomplish this function.

(3) Pressure. A vacuum supply hose must be of sufficient

length and wall strength to reach from the tank to the pressure vacuum source.

(4) Manometer. A liquid manometer or equivalent instrument must be capable of measuring up to 25 inches of water with scale division of 0.1 inches of water. A 1/4-inch hose to connect the manometer to the adapter tap is recommended.

(5) Stopwatch. A stopwatch with scale division to one second is required.

(6) Adapter. An adapter to connect the pressure vacuum hose to the tank with a shutoff valve to isolate the tank from the required pressure vacuum equipment is required. The adapter requires a shutoff valve, a tap to attach the manometer, and a bleed valve for adjusting pressure/vacuum to specified levels prior to start of timed period. However, each contractor must use an adapter compatible with his equipment.

(7) Caps. Dust caps with good gaskets are required on all outlets during the test.

(8) Pressure/Vacuum Relief Valves. The test apparatus should be equipped with an in line pressure/vacuum relief valve set to activate at 25 inches of water above atmospheric and 12 inches of water below if the pressure/vacuum equipment has greater capacity than the set points to prevent possible tank damage.

R307-342-5. Test Procedures and Preparations.

(1) Location. The delivery tank must be tested in a location where it will not be subject to direct sunlight. Shop heaters/air conditioners must be turned off during the test as they will affect the tank stability.

(2) Purging the Tank. A good purge is necessary.

(a) The tank must be emptied of gasoline and vapors before testing to minimize "vapor growth" problems. Hauling a load of diesel fuel is recommended.

(b) A steam purge to degas the tank is acceptable.

(c) An alternate method is to purge with a high volume of air. For this purge, the hatches are to be opened and purge air or inert gas should be blown through the tank for 30 minutes or more to degas the tank. This method is not as effective and often requires a much longer time for stabilization during the test.

(3) Visual Inspection. While the tank is being purged, or prior to the test, the entire tank should be visually inspected for evidence of wear, damage or misadjustments that could be a source of potential leaks. Areas to check are domes, dome vents, cargo tank piping, hose connections, hoses and delivery elbows. Any part found defective should be adjusted, repaired or replaced as necessary before the pressure test is started.

(4) Vents, Valves, and Outlets.

(a) The emergency valves in the bottom of the tank must be opened during the purge and then closed to test.

(b) Open the top vents. If the top vents are the pneumatic type, then a shop air line connection must be provided as the vents must be in the open position during the purge and then closed to test.

(c) In order to complete the test, some types of dome vents

may have to be replaced.

(d) During the test, all compartments must be interconnected so that the tank may be tested as a single unit. If this cannot be done, each compartment must be tested as a separate tank.

(e) Dust caps with good gaskets must be installed on all outlets.

(5) Pretest Preparation and Procedure.

(a) Open and close each dome cover.

(b) Connect the static electric ground connections to tank, attach the liquid delivery and vapor return hoses, remove liquid delivery elbows and seal the liquid delivery hose fitting, install dust caps on all outlets except the vapor return hose.

(c) Attach the test adapter to the vapor return hose of the tank under test with the shutoff valve closed.

(d) Connect the pressure supply hose to the adapter.

(e) Connect the 1/4-inch hose to the adapter tap and the manometer if applicable and position of the manometer or gauge at eye level.

(f) Open all internal vents and valves if possible. If not possible, each compartment must be tested as if each compartment was a separate tank.

(6) The Pressure Test.

(a) With all preparations complete, turn on the pressure source and open the shutoff valve in the adapter to apply air pressure slowly. Pressurize the tank to 18 inches of water.

(b) Close the shutoff valve and allow the pressure in the tank to stabilize. When the pressure has stabilized, read and record the time and initial pressure on the manometer.

(c) Allow five minutes to elapse, then read and record the final time and pressure.

(d) Disconnect the pressure source from the adapter and slowly open the shutoff valve to bring the tank to atmospheric pressure.

(e) Subtract the final pressures from the initial pressures.

(f) If the sustained pressure drop is greater than 3.0 inches of water, repair the leaks and then repeat the steps in (a) through (e).

(g) Repeat the steps in (a) through (f) until the change in pressure for two consecutive runs agrees within 1/2 inch of water. Calculate the arithmetic average of the two results.

(7) The Vacuum Test.

(a) Connect the vacuum source to the adapter. Start the vacuum source and slowly open the shutoff valve to evacuate the tank to six inches of water and close the shutoff valve.

(b) Allow the pressure in the tank to stabilize, adjust as necessary to maintain six inches of water vacuum until the pressure stabilizes.

(c) Read and record the time and the initial vacuum reading on the manometer. Allow five minutes to elapse, then read and record the final manometer reading.

(d) Disconnect the vacuum source from the adapter, and slowly open the shutoff valve to bring the tank to atmospheric pressure.

(e) Subtract the final reading from the initial reading.

(f) If the sustained vacuum loss is greater than three inches of water, the leakage source must be located and repaired. The steps in (a) through (e) must be repeated.

(g) Repeat the steps in (a) through (f) until the change in vacuum for two consecutive runs agree within 1/2 inches of water. Calculate the arithmetic average of the two results.

(8) When the calculated average pressure change in five minutes for both the pressure test and the vacuum test are three inches of water or less, the requirements of the test are satisfied and the tested tank may be certified leak tight.

R307-342-6. Certification of a Delivery Tank.

(1) The approved contractor will upon satisfactory completion of the vapor tightness test complete the documentation of certification in two copies. If desired, each contractor may prepare his own certificate as long as the following items are included:

(a) Gasoline delivery tank pressure test.
(b) Tank owner and address.
(c) Tank ID number.
(d) Testing location.
(e) Date of test.
(f) Tester name and signature.
(g) Company or affiliation of testers.
(h) Test data results.
(i) Date of next required test.

(2) The contractor will keep one copy that will be made available for inspection by the executive secretary for two years. The tank owner or operator will keep the other copy of the certification with the delivery tank for two years for inspection by the executive secretary.

(3) The approved contractor will mark the certified tank below the DOT test marking with "V.R. TESTED" followed by the month and year of the current certified test. The vapor recovery test marking shall be at least 1-1/4" high black permanent letters on a white background. The letters and numbers must be of a type that will remain legible from a distance of 20 feet for at least one year (painted or printed sticker is acceptable).

R307-342-7. Alternate Methods of Control.

(1) Any person may apply to the executive secretary for approval of an alternate test method, an alternate method of control, an alternate compliance period, an alternate emission limit, or an alternate monitoring schedule. The application must include a demonstration that the proposed alternate produces an equal or greater air quality benefit than that required by R307-342, or that the alternate test method is equivalent to that required by these rules. The executive secretary shall obtain concurrence from EPA when approving an alternate test method, an alternate method of control, an alternate compliance period, an alternate emission limit, or an alternate monitoring schedule.

(2) Manufacturer's operational specifications, records, and

testings of any control system shall use the applicable EPA Reference Methods of 40 CFR Part 60, the most recent EPA test methods, or EPA-approved state methods, to determine the efficiency of the control device. In addition, the owner or operator must meet the applicable requirements of record keeping for any control device. A record of all tests, monitoring, and inspections required by R307-342 shall be maintained by the owner or operator for a minimum of 2 years and shall be made available to the executive secretary or the executive secretary's representative upon request. Any malfunctioning control device shall be repaired within 15 calendar days after it is found by the owner or operator to be malfunctioning, unless otherwise approved by the executive secretary.

(3) For purposes of determining compliance with emission limits, volatile organic compounds and nitrogen oxides will be measured by the test methods identified in federal regulation or approved by the executive secretary. Where such a method also inadvertently measures compounds with negligible photochemical reactivity, an owner or operator may exclude these negligibly reactive compounds when determining compliance with an emissions standard.

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